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Appendix B.3

Supporting Data for Vegetation Resources

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2 This appendix could not be made fully Section 508 compliant. For help with any of its content, please contact the Bureau of Land
3 Management, Vale District Office, at 541-473-3144. Please reference Appendix B.3 of the December 2014 *Draft Environmental Impact*
4 *Statement and Land Use Plan Amendments for the Boardman to Hemingway Transmission Line Project.*

1 **Table B.3-1. Federal-, State-, and County-Designated Noxious Weeds with Potential to Occur**

Scientific Name	Common Name	Federal Listing	Idaho State List	Oregon State List	Oregon County List
<i>Abutilon theophrasti</i>	Velvetleaf	N/A	N/A	B	A (Union)
<i>Acroptilon repens</i> (<i>Centaurea repens</i>)	Russian knapweed	BLM WSC	Control (confirmed in Owyhee County)	B	A (Union) B (Baker, Malheur [3], Morrow, Umatilla)
<i>Aegilops cylindrica</i>	Jointed goatgrass	BLM WSC	Containment (not confirmed in Owyhee County)	B	A (Baker, Malheur) B (Morrow, Umatilla, Union)
<i>Alhagi maurorum</i> (<i>A. pseudalhagi</i>)	Camelthorn	BLM WSC	N/A	A	A (Malheur, Umatilla)
<i>Ambrosia artemisiifolia</i> var. <i>elator</i>	Ragweed or common ragweed	N/A	N/A	B	B (Umatilla) C (Malheur)
<i>Ambrosia tomentosa</i>	Skeletonleaf bursage	N/A	N/A	N/A	A (Malheur)
<i>Anchusa officinalis</i>	Common bugloss	N/A	N/A	B, T	A (Union)
<i>Avena fatua</i>	Wild oat	N/A	N/A	N/A	B (Morrow) C (Union)
<i>Bromus tectorum</i>	Cheatgrass	BLM WSC	N/A	N/A	C (Malheur)
<i>Calystegia sepium</i> (<i>Convolvulus sepium</i> and <i>C. sepium</i> var. <i>repens</i>)	Morning glory	N/A	N/A	N/A	A (Umatilla) B (Union)
<i>Cannabis sativa</i>	Marijuana	N/A	N/A	N/A	A (Umatilla)
<i>Cardaria chalepensis</i> (<i>Lepidium chalepensis</i>)	Lens-podded whitetop	N/A	N/A	B	N/A
<i>Cardaria draba</i> (<i>Lepidium draba</i>)	Hoary cress (whitetop)	BLM WSC	Containment (confirmed in Owyhee County)	B	A (Baker [4], Union, Morrow) B (Malheur, Umatilla, Union [5])
<i>Cardaria pubescens</i>	Hairy whitetop	BLM WSC	N/A	N/A	
<i>Carduus nutans</i>	Musk thistle	BLM WSC	Control (confirmed in Owyhee County)	B	A (Union, Morrow) B (Malheur, Umatilla)
<i>Carduus pycnocephalus</i>	Italian thistle	BLM WSC	N/A	B	A (Malheur)
<i>Carduus tenuiflorus</i>	Slender-flowered thistle	BLM WSC	N/A	B	A (Malheur)
<i>Carthamus lanatus</i> ssp. <i>creticus</i> (<i>Carthamus baericus</i>)	Smooth distaff thistle or wooly distaff thistle	BLM WSC	N/A	A, T	A (Malheur)
<i>Centaurea calcitrapa</i>	Purple starthistle	BLM WSC	N/A	A, T	A (Malheur, Umatilla)
<i>Centaurea diffusa</i>	Diffuse knapweed	BLM WSC	Containment (confirmed in Owyhee County)	B	A (Baker, Malheur) B (Morrow, Union [2], Umatilla) C (Union [2])

Scientific Name	Common Name	Federal Listing	Idaho State List	Oregon State List	Oregon County List
<i>Centaurea iberica</i>	Iberian starthistle	BLM WSC	N/A	A, T	A (Malheur)
<i>Centaurea jacea</i>	Brownray knapweed	BLM WSC	N/A	N/A	A (Umatilla)
<i>Centaurea macrocephala</i>	Big-headed knapweed	BLM WSC	N/A	N/A	A (Malheur)
<i>Centaurea nigrescens</i> (<i>Centaurea pratensis</i> or <i>C. debeauxii</i>)	Meadow knapweed or short-fringe knapweed	BLM WSC	Control (not known in Owyhee County)	B	A (Malheur, Union)
<i>Centaurea solstitialis</i>	Yellow starthistle	BLM WSC	Containment (not confirmed in Owyhee County)	B, T	A (Baker, Malheur, Morrow) B (Umatilla, Union)
<i>Centaurea stoebe</i> (<i>Centaurea maculosa</i> or <i>C. biebersteinii</i>)	Spotted knapweed	BLM WSC	Containment (confirmed in Owyhee County)	B, T	A (Baker, Malheur, Morrow, Umatilla, Union)
<i>Centaurea trichocephala</i>	Featherheaded knapweed	BLM WSC	N/A	N/A	A (Malheur)
<i>Centaurea virgata</i> (<i>Centaurea triumphetti</i>)	Squarrose knapweed	N/A	Early Detection and Rapid Response (not known in Owyhee County)	A, T	A (Malheur)
<i>Centromadia pungens</i> ssp. <i>septentrionalis</i> (<i>Hemizonia pungens</i>)	Spikeweed	N/A	N/A	B	A (Morrow)
<i>Ceratocephala testiculata</i> (<i>Ranunculus testiculatus</i>)	Bur buttercup	N/A	N/A	N/A	C (Baker)
<i>Chondrilla juncea</i>	Rush skeletonweed	N/A	Containment (confirmed in Owyhee County)	B, T	A (Baker, Malheur, Morrow, Umatilla, Union)
<i>Cichorium intybus</i>	Chickory	BLM WSC	N/A	N/A	B (Baker)
<i>Cicuta douglasii</i>	Water hemlock	N/A	N/A	N/A	B (Morrow) C (Baker, Union)
<i>Cirsium arvense</i>	Canada thistle	BLM WSC	Containment (confirmed in Owyhee County)	B	B (Malheur, Morrow, Umatilla, Union)
<i>Cirsium vulgare</i>	Bull thistle	BLM WSC	N/A	B	B (Baker) C (Malheur)
<i>Conium maculatum</i>	Poison hemlock	BLM WSC	Containment (confirmed in Owyhee County)	B	B (Morrow) C (Baker, Malheur, Union)
<i>Convolvulus arvensis</i>	Morning glory or field bindweed	BLM WSC	Containment (confirmed in Owyhee County)	A, T	B (Morrow) C (Baker, Malheur)
<i>Conyza</i> sp.	Horse weed or mares tail	N/A	N/A	N/A	B (Union, as <i>Conyza canadensis</i> ?)

Scientific Name	Common Name	Federal Listing	Idaho State List	Oregon State List	Oregon County List
<i>Crupina vulgaris</i> var. <i>vulgaris</i>	Common crupina	USDA Noxious, BLM WSC	Control (not confirmed in Owyhee County)	B	A (Malheur, Morrow)
<i>Cuscuta pentagona</i> var. <i>pentagona</i> (<i>Cuscuta campestris</i>)	Dodder or field dodder	N/A	N/A	B	B (Baker, Morrow, Umatilla) C (Malheur)
<i>Cynoglossum officinale</i>	Houndstongue	BLM WSC	Containment (not confirmed in Owyhee County)	B	A (Morrow) B (Malheur)
<i>Cyperus esculentus</i> var. <i>leptostachyus</i> (<i>Cyperus esculentus</i> var. <i>esculentus</i>)	Yellow nutsedge	N/A	NA	A	C (Malheur)
<i>Cytisus scoparius</i>	Scotch broom	BLM WSC	Control (confirmed in Owyhee County)	B	A (Union)
<i>Datura stramonium</i>	Jimsonweed	N/A	N/A	N/A	A (Malheur)
<i>Dipsacus fullonum</i>	Teasel	BLM WSC	N/A	N/A	B (Baker)
<i>Echium vulgare</i>	Viper's bugloss	BLM WSC	Control (not confirmed in Owyhee County)	N/A	B (Umatilla)
<i>Elaeagnus angustifolia</i>	Russian olive	BLM WSC	N/A	N/A	N/A
<i>Elymus repens</i> (<i>Elytrigia repens</i> or <i>Agropyron reopens</i>)	Quackgrass	BLM WSC	N/A	B	B (Umatilla) C (Malheur, Union)
<i>Equisetum arvense</i>	Western horsetail	N/A	N/A	N/A	C (Malheur, Union)
<i>Euphorbia esula</i>	Leafy spurge	BLM WSC	Containment (confirmed in Owyhee County)	B, T	A (Baker, Malheur, Morrow, Umatilla, Union)
<i>Euphorbia myrsinites</i>	Myrtle spurge	N/A	N/A	B	B (Baker)
<i>Galium aparine</i>	Catchweed bedstraw	N/A	N/A	N/A	B (Union)
<i>Halogeton glomeratus</i>	Halogeton	BLM WSC	N/A	B	C (Malheur)
<i>Hibiscus trionum</i>	Venice mallow	N/A	N/A	N/A	B (Baker)
<i>Hydrilla verticillata</i>	Hydrilla	USDA Noxious	EDRR (confirmed in Owyhee County)	A	A (Malheur)
<i>Hyoscyamus niger</i>	Black henbane	BLM WSC	Control (confirmed in Owyhee County)	N/A	A (Baker)
<i>Hypericum perforatum</i>	Klamathweed or St. Johnswort)	BLM WSC	N/A	B	B (Baker, Malheur, Morrow, Umatilla)

Scientific Name	Common Name	Federal Listing	Idaho State List	Oregon State List	Oregon County List
<i>Iris pseudacorus</i> (<i>Iris pseudocorus</i>)	Yellow flag iris	N/A	Containment (confirmed in Owyhee County)	B	A (Baker)
<i>Isatis tinctoria</i>	Dyers woad	BLM WSC	Control (confirmed in Owyhee County)	B	A (Malheur, Union)
<i>Kochia scoparia</i>	Kochia	N/A	N/A	B	B (Morrow, Umatilla, Union) C (Baker, Malheur)
<i>Lepidium strictum</i> (<i>Lepidium pubescens</i>)	Hairy whitetop or upright pepperweed	N/A	N/A	B	N/A
<i>Lepidium latifolium</i>	Perennial pepperweed	BLM WSC	Containment (confirmed in Owyhee County)	B, T	A (Baker, Malheur [6], Union) B (Malheur [6], Umatilla)
<i>Linaria dalmatica</i>	Dalmation toadflax	BLM WSC	Containment (confirmed in Owyhee County)	B, T	A (Baker, Morrow, Union) B (Umatilla)
<i>Linaria vulgaris</i>	Yellow toadflax	BLM WSC	Containment (not confirmed in Owyhee County)	B	B (Baker, Malheur, Morrow)
<i>Lyrum salicaria</i>	Purple loosestrife	BLM WSC	Containment (confirmed in Owyhee County)	B	A (Baker, Umatilla, Union), Morrow B (Malheur)
<i>Melilotus officinalis</i>	Sweet clover	N/A	N/A	N/A	C (Malheur)
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	BLM WSC	Control (confirmed in Owyhee County)	B	N/A
<i>Onopordum acanthium</i>	Scotch thistle	BLM WSC	Containment (confirmed in Owyhee County)	B	A (Baker, Morrow) B (Malheur, Umatilla, Union)
<i>Panicum miliaceum</i>	Wild proso millet	BLM WSC	N/A	N/A	A (Malheur)
<i>Phragmites australis</i> (<i>Phragmites australis</i> ssp. <i>australis</i>)	Common reed	N/A	Control (confirmed in Owyhee County)	B	N/A
<i>Polygonum cuspidatum</i> (<i>Fallopia japonica</i>)	Japanese knotweed	N/A	Control (confirmed in Owyhee County)	B	A (Baker)
<i>Polygonum polystachyum</i>	Himalayan knotweed	N/A	N/A	B	A (union)
<i>Polygonum sachalinense</i> (<i>Fallopia sachalinensis</i>)	Giant knotweed	N/A	Control (not known in Owyhee County)	N/A	A (Union)

Scientific Name	Common Name	Federal Listing	Idaho State List	Oregon State List	Oregon County List
<i>Polygonum xbohemicum</i>	Bohemian knotweed	N/A	Control (not known in Owyhee County)	N/A	A (Union)
<i>Potamogeton crispus</i>	Curlyleaf pondweed	N/A	Containment (confirmed in Owyhee County)	N/A	N/A
<i>Potentilla recta</i>	Sulphur cinquefoil)	BLM WSC	N/A	B	A (Malheur) B (Baker, Union)
<i>Rorippa sylvestris</i>	Creeping yellow cress	N/A	N/A	B	A (Umatilla)
<i>Salsola tragus</i> (<i>Salsola tenuifolia</i> var. <i>kali</i> , <i>S. kali</i> var. <i>tenuifolia</i> , <i>S. kali</i> ssp. <i>tragus</i> , <i>S. iberica</i>)	Russian thistle	N/A	N/A	N/A	C (Baker, Union)
<i>Salvia aethiopis</i>	Mediterranean sage	BLM WSC	Control (not known in Owyhee County)	B	A (Malheur, Morrow)
<i>Secale cereale</i>	Cereal rye	N/A	N/A	N/A	B (Umatilla, Morrow) C (Union)
<i>Senecio jacobaea</i>	Tansy ragwort	BLM WSC	Containment (not known in Owyhee County)	B, T	A (Baker, Malheur, Morrow Umatilla, Union)
<i>Silybum marianum</i>	Milk thistle	N/A	N/A	B	A (Malheur)
<i>Solanum elaeagnifolium</i>	Silverleaf nightshade	N/A	Yes (but no further designation; not confirmed in Owyhee County)	A	A (Malheur)
<i>Solanum rostratum</i>	Buffalobur	N/A	Control (confirmed from Owyhee County)	B	A (Baker, Malheur, Union)
<i>Sonchus arvensis</i>	Perennial sowthistle	BLM WSC	Control (confirmed in Owyhee County)	N/A	B (Morrow)
<i>Sorghum halepense</i>	Johnsongrass	BLM WSC	Control (not known in Owyhee County)	B	A (Malheur) B (Morrow, Umatilla)
<i>Sphaerophysa salsula</i>	Austrian peaweed or swainsonpea	BLM WSC	N/A	B	A (Malheur) B (Umatilla)
<i>Taeniatherum caput-medusae</i> (<i>Elymus caput-medusae</i>)	Medusahead wildrye	BLM WSC	N/A	B	B (Morrow) C (Baker, Malheur)
<i>Tamarix parviflora</i> (<i>Tamarix ramosissima</i>)	Saltcedar or small flower tamarisk	BLM WSC	Containment (confirmed in Owyhee County)	B, T	A (Baker) C (Malheur)
<i>Tanacetum vulgare</i>	Common tansy	BLM WSC	N/A	N/A	B (Baker)

Scientific Name	Common Name	Federal Listing	Idaho State List	Oregon State List	Oregon County List
<i>Tribulus terrestris</i>	Puncturevine	N/A	Containment (confirmed in Owyhee County)	B	B (Baker, Malheur, Morrow, Umatilla, Union)
<i>Verbascum blattaria</i>	Moth mullein	N/A	N/A	N/A	B (Baker)
<i>Verbascum thapsus</i>	Common mullein	N/A	N/A	N/A	B (Baker)
<i>Xanthium spinosum</i>	Spiny cocklebur	N/A	N/A	B	A (Malheur)

Table Source: US Fish and Wildlife Service list of threatened, endangered, proposed, and candidate species occurring in Baker, Malheur, Morrow, Owyhee, Umatilla, and Union Counties (<http://oregon.fws.gov/> and <http://idaho.fws.gov/>, accessed June 15, 2013).

Table Abbreviations: A = Class "A" Weed (highest priority), B = Class "B" Weed, C = Class "C" Weed, EDRR = early detection and rapid response, N/A = not applicable (meaning the noxious weed is not listed), WSC = weed species of concern, USDA = U.S. Department of Agriculture.

**Table B.3-2. Crosswalk between Vegetation Community
and National Vegetation Classification System Macrogroups**

Primary Vegetation Community	Subtype	Ecological System	National Vegetation Classification System (NVCS) Macrogroup
Grassland	Native Grassland	Columbia Basin Foothill and Canyon Dry Grasslands	Northern Rocky Mountain-Vancouverian Montane & Foothill Grassland & Shrubland
Grassland	Native Grassland	Columbia Basin Palouse Prairie	Northern Rocky Mountain-Vancouverian Montane & Foothill Grassland & Shrubland
Grassland	Native Grassland	Northern Rocky Mountain Lower Montane Foothill and Valley Grassland	Northern Rocky Mountain-Vancouverian Montane & Foothill Grassland & Shrubland
Grassland	Native Grassland	Columbia Plateau Steppe and Grassland	Great Basin & Intermountain Tall Sagebrush Shrubland & Steppe
Grassland	Native Grassland	Inter-Mountain Basins Semi-Desert Grassland	Great Basin & Intermountain Dry Shrubland & Grassland
Grassland	Native Grassland	Rocky Mountain Subalpine-Montane Mesic Meadow	Rocky Mountain-Vancouverian Subalpine & High Montane Mesic Grass & Forb Meadow
Grassland	Native Grassland	Rocky Mountain Alpine-Montane Wet Meadow	Western North American Montane Wet Meadow & Low Shrubland
Grassland	Nonnative Grassland	Introduced Upland Vegetation - Annual Grassland	Introduced & Semi Natural Vegetation
Grassland	Nonnative Grassland	Recently burned grassland	Recently Disturbed or Modified
Shrubland	Desert Shrub	Inter-Mountain Basins Greasewood Flat	Cool Semi-Desert Alkali-Saline Wetland
Shrubland	Desert Shrub	Inter-Mountain Basins Mixed Salt Desert Scrub	Great Basin Saltbrush Scrub
Shrubland	Dwarf Sagebrush Steppe	Columbia Plateau Low Sagebrush Steppe	Great Basin & Intermountain Dwarf Sage Shrubland & Steppe
Shrubland	Dwarf Sagebrush Steppe	Columbia Plateau Scabland Shrubland	
Shrubland	Tall Sagebrush Steppe	Great Basin Xeric Mixed Sagebrush Shrubland	Great Basin & Intermountain Tall Sagebrush Shrubland & Steppe
Shrubland	Tall Sagebrush Steppe	Inter-Mountain Basins Big Sagebrush Shrubland	Great Basin & Intermountain Tall Sagebrush Shrubland & Steppe
Shrubland	Tall Sagebrush Steppe	Inter-Mountain Basins Big Sagebrush Steppe	Great Basin & Intermountain Tall Sagebrush Shrubland & Steppe
Shrubland	Tall Sagebrush Steppe	Inter-Mountain Basins Montane Sagebrush Steppe	Great Basin & Intermountain Tall Sagebrush Shrubland & Steppe
Shrubland	Tall Sagebrush Steppe	Inter-Mountain Basins Semi-Desert Shrub Steppe	Great Basin & Intermountain Dry Shrubland & Grassland

Primary Vegetation Community	Subtype	Ecological System	National Vegetation Classification System (NVCS) Macrogroup
Shrubland	Mountain Shrub	Northern Rocky Mountain Montane-Foothill Deciduous Shrubland	Northern Rocky Mountain-Vancouverian Montane & Foothill Grassland & Shrubland
Forest/Woodland	Mixed Conifer Forest	Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest	Northern Rocky Mountain Lower Montane & Foothill Forest
Forest/Woodland	Mixed Conifer Forest	Northern Rocky Mountain Mesic Montane Mixed Conifer Forest	Northern Rocky Mountain Lower Montane & Foothill Forest
Forest/Woodland	Mixed Conifer Forest	Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	Northern Rocky Mountain Lower Montane & Foothill Forest
Forest/Woodland	Mixed Conifer Forest	Northern Rocky Mountain Western Larch Savanna	Northern Rocky Mountain Lower Montane & Foothill Forest
Forest/Woodland	Mixed Conifer Forest	Rocky Mountain Lodgepole Pine Forest	Rocky Mountain Subalpine & High Montane Conifer Forest
Forest/Woodland	Mixed Conifer Forest	Rocky Mountain Poor-Site Lodgepole Pine Forest	Rocky Mountain Subalpine & High Montane Conifer Forest
Forest/Woodland	Mixed Conifer Forest	Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	Rocky Mountain Subalpine & High Montane Conifer Forest
Forest/Woodland	Rocky Mountain Aspen	Rocky Mountain Aspen Forest and Woodland	Rocky Mountain Subalpine & High Montane Conifer Forest
Forest/Woodland	Rocky Mountain Aspen	Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	Rocky Mountain Subalpine & High Montane Conifer Forest
Forest/Woodland	Juniper and Mahogany Woodland	Columbia Plateau Western Juniper Woodland and Savanna	Intermountain Singleleaf Pinyon - Western Juniper Woodland
Forest/Woodland	Juniper and Mahogany Woodland	Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	Intermountain Singleleaf Pinyon - Western Juniper Woodland
Bare Ground, Cliffs, Talus	Bare Ground, Cliffs, Talus	Columbia Plateau Ash and Tuff	Intermountain Basin Cliff, Scree & Rock Vegetation
Bare Ground, Cliffs, Talus	Bare Ground, Cliffs, Talus	Inter-Mountain Basins Active and Stabilized Dune	Intermountain Basin Cliff, Scree & Rock Vegetation
Bare Ground, Cliffs, Talus	Bare Ground, Cliffs, Talus	Inter-Mountain Basins Cliff and Canyon	Intermountain Basin Cliff, Scree & Rock Vegetation
Bare Ground, Cliffs, Talus	Bare Ground, Cliffs, Talus	Inter-Mountain Basins Playa	Cool Semi-Desert Alkali-Saline Wetland
Bare Ground, Cliffs, Talus	Bare Ground, Cliffs, Talus	Rocky Mountain Cliff, Canyon and Massive Bedrock	Rocky Mountain Cliff, Scree & Rock Vegetation
Agriculture	Agriculture	Cultivated Cropland	Herbaceous Agricultural Vegetation

Primary Vegetation Community	Subtype	Ecological System	National Vegetation Classification System (NVCS) Macrogroup
Agriculture	Agriculture	Pasture/Hay	Herbaceous Agricultural Vegetation
Developed/Disturbed	Developed/Disturbed	Developed, High Intensity	Developed & Urban
Developed/Disturbed	Developed/Disturbed	Developed, Low Intensity	Developed & Urban
Developed/Disturbed	Developed/Disturbed	Developed, Medium Intensity	Developed & Urban
Developed/Disturbed	Developed/Disturbed	Developed, Open Space	Developed & Urban

SPECIAL STATUS PLANTS

LAURENT'S MILK-VETCH (STATE THREATENED)

Laurent's milk-vetch (*Astragalus collinus* var. *laurentii*), also known as Laurence's milk-vetch, is an Oregon endemic found in 14 counties in Oregon. It grows on barren grassy hillsides and scablands on basalt tablelands with northwest to south 10-30+% slopes, adjacent to cultivated land and on roadsides; in white-clay loam, silty white-clay, loess deposits and (in disturbed sites) dry cobbly soil, reportedly also on sand dunes; reported from 2000 to 3400 feet elevation; associated with *Pseudoroegenaria spicata*-*Festuca idahoensis* Herbaceous Vegetation and *Pseudoroegenaria spicata*-*Poa secunda* Herbaceous Vegetation associations, locally tending towards savannas with *Juniperus scopulorum* (CPNH 2013, NatureServe 2013, OFP 2012, ORBIC 2010a, Tetra Tech 2012). Its Global Status is G5T1 (critically imperiled), due to being endemic to Oregon with a relatively narrow range. About 18 occurrences were known in 1983, with plant numbers estimated at 1200 to 1800. Populations are threatened by farming, grazing, and roadside spraying. No sites are considered protected by NatureServe (NatureServe 2013). As this species is dependent on pollinators to produce seed and cannot self-fertilize, it is sensitive to impacts/losses that occur to its pollinators. Furthermore, this species is sensitive to habitat loss and degradation resulting from agricultural development, grazing, road maintenance activities, and invasions by exotic weeds, as well as seed predation by insects (ODA 2011). Laurent's milk-vetch is presently documented from numerous occurrences along the Proposed Action, the closest being 0.3 miles from the right-of-way in the upper Alkali Canyon watershed of western Umatilla County.

MINGAN MOONWORT (USFS SENSITIVE)

Mingan moonwort (*Botrychium minganense*) occurs in 20 states and Canada, including eight northern Idaho counties (USDA 2012). It is also found in 13 counties in Oregon, including in Baker, Morrow, Umatilla, and Union Counties (ORBIC 2010b). Mingan moonwort has been known to grow in a range of habitats, including forests, shrublands, and nearly unvegetated slopes. It may grow on soils that are wet in the spring, but typically occurs on soils that dry out as the growing season progresses. For herbarium specimens and documented occurrences in and adjacent to Union and Baker County, it ranges in elevation from 1158 to 2173 meters. Its Global Status is G4G5 (apparently secure), because is scattered but widespread, although considered rare or uncommon where found, often with very few individuals per site. Some of the locations are protected in special management areas (NatureServe 2013). Oregon populations were reported in the 1990s and it is not known if they have contemporary data on population density and viability (OFP 2012). In Oregon, total plant numbers were reported to be about 3000. However, many occurrences have very few individuals; for example, most of the occurrences in Oregon were reported to have ten plants or fewer (NatureServe 2012).

There is one known occurrences of Mingan moonwort within 5 miles of the Proposed Action and two known occurrences at 0.27 and 4.2 miles from the right-of-way of the Timber Canyon Alternative. Current population statuses are unknown (OFP 2012).

1 *SALT HELIOTROPE (OREGON BLM SENSITIVE, USFS SENSITIVE)*

2 Salt heliotrope (*Heliotropium curassavicum* var. *obovatum*), also known as seaside heliotrope, occurs in
3 fourteen states and Canada. Found in salty ground, disturbed or dry roadsides; in sand, damp ground
4 and moist alkaline soil; reported from 2,070 to 5,000 feet elevation; in semi-natural habitats associated
5 with weeds such as *Xanthium strumarium*, *Toxicodendron rydbergii*, *Juncus torreyi*, *Rorippa*
6 *nasturtium-aquaticum*, *Sesuvium verrucosum* and *Veronica anagallis-aquatica* (CPNH 2013;
7 NatureServe 2013; OFP 2012). It has a Global Status of G5T5 (secure), but lacks analysis by
8 NatureServe of its conservation status. There are three occurrences of salt heliotrope within 5 miles of
9 the Project in Union, Baker and Malheur Counties, the closest occurrences being 0.7 mile from the
10 right-of-way of the Flagstaff Alternative and within 1.0 miles of the Proposed Action. Current population
11 status is unknown, and existing data is based on herbarium specimens and observation records which
12 are mostly pre-2000.

13 *HOWELL'S SPECTACULAR THELYPODY (USFWS THREATENED, OREGON BLM*
14 *SENSITIVE, STATE ENDANGERED)*

15 Howell's spectacular thelypody (*Thelypodium howellii* ssp. *spectabilis*), also known as Howell's
16 thelypody, was included as a federally threatened species on June 25, 1999 (64 Federal Register [FR]
17 28393). It is known from only Union, Baker, and Malheur Counties, Oregon, with presently documented
18 populations restricted to the Baker Powder Valley and the Willow Valley. Howell's spectacular
19 thelypody is found in alkali meadows that are seasonally wet in the spring; between 3,000 and 3,500
20 feet elevation. Thelypody habitat typically has not been disturbed by agriculture and is dominated by
21 basin wildrye (*Leymus cinereus*) with greasewood (*Sarcobatus vermiculatus*) and alkali saltgrass
22 (*Distichlis stricta*) (USFWS 2002). It has a Global Status of G2T1 (critically imperiled) because of being
23 a narrow endemic with much of the habitat having been destroyed and only a few historical populations
24 remaining. Of the 12 documented populations, only 2 are protected (USFWS 2002). The habitat of
25 Howell's spectacular thelypody has been disturbed primarily for agriculture uses although grazing,
26 invasive species, and other human activities also threaten the species. This biennial species is short-
27 lived and depends on frequent seed production for its continued survival. This species also needs
28 adequate moisture to thrive; therefore, droughts can have adverse impacts on the species (CPC 2010).

29 There are twelve known occurrences of Howell's spectacular thelypody within 5 miles of the Proposed
30 Action and alternatives in Union and Baker Counties; the closest occurrences are 1.2 miles from the
31 Proposed Action and 3.8 miles from the right-of-way of the Flagstaff Alternative. Neither cross suitable
32 habitat, although there are access roads to the Proposed Action which pass occupied habitat.

33 *DOUGLAS' CLOVER (OREGON BLM SENSITIVE, USFS SENSITIVE)*

34 Douglas' clover (*Trifolium douglasii*) occurs in three states and is known from wet meadows, often
35 along creeks, riparian meadows, moist areas along trails, open grasslands and shrubland; in clay soil,
36 thin soils over basalt and on rocky basalt soil; reported from 3,400 to 7,000 feet elevation; in plant
37 communities dominated by *Pseudoroegneria spicata* and *Festuca idahoensis*, interspersed with
38 scablands dominated by *Poa secunda* and *Artemisia tripartita* (CPNH 2013; INPS 2000; IRHN 2013;

NatureServe 2013; OFP 2012). Its Global Status is G2 (imperiled) due to being restricted to a small area in northeast Oregon, southeast Washington, and adjacent Idaho. It is rare throughout its range and threatened by grazing and by agricultural conversion (NatureServe 2013). Livestock grazing is a threat to the Oregon populations, but populations persist when grazing pressure is lessened. When heavily grazed heavily, only a few plants may exist and few native species can be found. Rotation of livestock which allow cattle on only after mid-September appears to maintain populations through increased seed recruitment (INPS 2000). There is one occurrence of Douglas's clover within 2.4 miles of the Proposed Action, in the Ladd Marsh Game Management Area in Union County. Current population status is unknown.

MANY-FLOWERED PHLOX (OREGON BLM SENSITIVE, USFS SENSITIVE)

Many-flowered phlox (*Phlox multiflora*), also known as flowery phlox, occurs in eight states. It is found (in Oregon) in coniferous forests, rocky meadow edges, roadsides, rocky slopes, ridge tops, rock outcrops and cliffs; in residual soils; reported from 3,200 to 4,600 feet elevation; associated with open and treed plant communities dominated by *Pinus ponderosa* and *Pseudotsuga menzeisii* (CPNH 2013; NatureServe 2013; OFP 2012). Its Global Status is G4 (apparently secure), but lacks analysis by NatureServe of its conservation status. There are presently known occurrences of many-flowered phlox beginning at approximately 3.2 miles from the Proposed Action in the valley of the Grande Ronde River in Union County. Current population statuses are unknown.

OREGON SEMAPHORE GRASS (OREGON BLM SENSITIVE, USFS SENSITIVE, STATE THREATENED)

Oregon semaphore grass (*Pleuropogon oregonus*), also known by the scientific name *Lophochlaena oregona*, are centered in two very distinct locations in Oregon (one in Union County), separated by about 230 mi (370 km). It occupies dry meadows, wet seeps, wet sedge meadows, valley bottoms, slow moving creek channels and sloughs usually in standing water; in silt loam, clay, muck and residual soils from basalt substrate; reported from 3,600 to 5,600 feet elevation; associated with plant communities dominated by *Deschampsia caespitosa* and *Deschampsia caespitosa-Hordeum brachyantherum* (CPC 2012; CPNH 2013, IRHN 2013; NatureServe 2013; ODA 2012a). Oregon semaphore grass has a Global Status of G1 (critically imperiled) and is known from only eight occurrences. The total number of plants is unknown due to the difficulty in identifying an individual. Plant numbers may be very low. A portion of one population is being protected by The Nature Conservancy. Otherwise all sites are on private land with no protections. Changes in hydrology or grazing regime thus threaten all natural populations. Climate change may further reduce suitable habitat (NatureServe 2013). The closest occurrence of Oregon semaphore grass is located 0.9 mile from the right-of-way of the Proposed Action in Ladd Canyon, Union County. Current population status is unknown and most data is from the 1980s.

WHITEBARK PINE (USFWS CANDIDATE, OREGON BLM SENSITIVE, USFS SENSITIVE)

Whitebark pine (*Pinus albicaulis*) was included as a federal candidate species on July 19, 2011 (76 FR 42631). Reported habitats for whitebark pine in Baker County and adjacent Union County include the

following: tops of ridges, near tops of mountains or peaks, dry open basalt plateaus, in crevices of granodiorite rock; on powdery soil, rocky, gravelly soil; and rocky crags; reported from 6,920 to 8,990 feet elevation; associated with subalpine and coniferous woodlands, subalpine meadows with patchy trees and alpine meadows in plant communities dominated wholly by, or with various combinations of: *Artemisia tridentata*, *Abies lasiocarpa*, *Ranunculus* sp., and *Juniperus* sp. (CPNH 2013; IRHN 2013; NatureServe 2013; OFP 2013). It has a Global Status of G3G4 (vulnerable), despite being a common tree where it occurs. It is limited to only upper subalpine forests of many western North American mountain ranges. It is, however, severely threatened in the majority of its range by introduced white pine blister rust (*Cronartium ribicola*), outbreaks of mountain pine beetle (*Dendroctonus ponderosae*), succession resulting from decades of fire suppression, climate change resulting in decreases in suitable habitat, and various synergies between these factors. Although a few areas such as the southern Sierra Nevada in California and the interior Great Basin ranges, as well as scattered stands in the rest of the range, still appear to contain large numbers of relatively healthy trees, it is expected that the blister rust will eventually become abundant in the vast majority of the range, causing significant tree mortality. Tree mortality rates exceeding 50% have already been documented in numerous parts of the range. A small percentage (1-5%) of trees appear naturally resistant to the blister rust, and restoration strategies hope to propagate these genotypes for use in restoration, although even rust-resistant trees will remain threatened by other factors. In addition, it has relatively low genetic variation and exists as a fragmentary species, making it more vulnerable than its range might indicate. This is a keystone species of high-elevation western ecosystems whose decline is expected to have cascading effects on ecosystem function and biodiversity (NatureServe 2013).

No suitable habitat is present in the B2H Project Area and whitebark pine does not occur closer than 11 miles from the Timber Canyon Alternative, at elevations above approximately 6,920 feet, thus 1,810 feet above the highest point on the Timber Canyon Alternative. Thus, no further analysis is needed.

CALCAREOUS BUCKWHEAT (IDAHO BLM SENSITIVE)

Calcareous buckwheat (*Eriogonum ochrocephalum* var. *calcareum*) is also known as whitewoolly buckwheat and as Harper wild buckwheat (*Eriogonum calcareum*). Calcareous buckwheat is known from Nevada, southern Baker and northern Malheur Counties, Oregon, and from Elmore, Owyhee, Payette, Twin Falls and southern Washington Counties, Idaho. Habitat data from herbarium specimens in Idaho includes: on ashy-clay hillsides; on heavy clay hillsides; in heavy clay soil above the creek; bare slopes with depauperate sagebrush; chalky hillside. Associated species include *Artemisia* sp. and *Atriplex confertifolia* (CPNH 2012). It has been reported as locally abundant on barren white volcanic ash-clay, diatomaceous or gumbo flats, washes and slopes, associated with *Artemisia arbuscula*, *Chrysothamnus nauseosus* and *Sitanion* sp. (NatureServe 2013) in saltbush and sagebrush communities, and in juniper woodlands; between 600 and 1800 meters elevation (Reveal 2010). Its Global Status is G5T3 (vulnerable), due to moderate numbers, abundance and range, with threats but the ability to recolonize disturbed sites, including diatomaceous mine tailings (NatureServe 2013). There are approximately 4 populations within 5 miles of the Proposed Action in Oregon; no known

occurrences within 5 miles of the Proposed Action in Idaho. May occur in Idaho; no further analysis anticipated in Oregon.

CRENULATE MOONWORT (OREGON BLM, USFS SENSITIVE, STATE CANDIDATE)

Crenulate moonwort (*Botrychium crenulatum*) is a calciphile which occurs in 9 states and Canada. Found (in northeastern Oregon) in disturbed areas such as dry road ditches, eroding river banks, old avalanche meadows and large open meadows; in well drained gravelly substrate; reported from approximately 5,250 to 8,240 feet elevation; often associated with relatively sparse vegetation dominated by *Fragaria* sp., sometimes with an overstory of *Abies lasiocarpa* and *Picea engelmannii*. (CPNH 2013; Johnson-Groh 2007; NatureServe 2013). Its Global Status is G3G4 (vulnerable), but lacks analysis by NatureServe of its conservation status outside of California. The closest known occurrence of crenulate moonwort is 12.5 miles from the Flagstaff Alternative in Baker County, but may occur in suitable habitats near the highest elevations of the Timber Canyon Alternative.

CUSICK'S LUPINE (OREGON BLM SENSITIVE, STATE ENDANGERED)

Cusick's lupine (*Lupinus lepidus* var. *cusickii*), also known by the scientific name *Lupinus cusickii* ssp. *cusickii*, occurs in four states and Canada. Found (in Idaho and Oregon) on gravelly slopes of high serpentine ridges, dry ground and hills, dry road cut banks, clay slopes, rocky scabland, barren ash flows, moist ground, prairie and gravel bars; in white ash soils and stony ground; reported from 2,900 to 5,145 feet elevation; known to be associated with *Artemisia tridentata* - *Peraphyllum ramosissimum* / *Festuca idahoensis* Shrubland and scattered junipers, but vegetation associates have rarely been reported (CPNH 2013, IRHN 2013, NatureServe 2013, OFP 2012). Its Global Status is G5 (secure), because it is common in dry habitats of western North America, with thousands of occurrences (NatureServe 2013). There are no known occurrences of Cusick's lupine within 26 miles of the Proposed Action or alternatives, but it may occur since suitable habitat is present.

MALHEUR PRINCE'S PLUME (OREGON AND IDAHO BLM SENSITIVE, STATE CANDIDATE)

Malheur prince's plume (*Stanleya confertiflora*), also known as Oregon prince's plume or biennial stanleya, occurs in three counties in Oregon, including Baker and Malheur Counties, as well as in Owyhee County, Idaho where it is known from scattered populations that tend to be small and local. Found on barren clay hills and slopes, open nearly barren soft loamy (dunelike) hills, somewhat barren west-facing slopes, dry sandy ground and dry banks; in adobe clay, red sandy soil and soils covered with pale gray chips of diatomite; reported from 2,200 to 7,300 feet elevation; associated with sagebrush, sagebrush-steppe, or *Eriogonum* dominated habitats (CPNH 2013; IRHN 2013; NatureServe 2013; OFP 2012). Malheur prince's plume has a Global Status of G2 (imperiled), because it occurs as scattered populations that tend to be small and local. Its generalized range is about 14,000 sq. km. There are 44 occurrences total, with eight occurrences known for Idaho and 36 presumed extant occurrences in Oregon. Total plants number about 8000 plants, with 7000 in Oregon and another 1000 in Idaho. Threats are weed invasion, seeding projects, motorized off-road-vehicle riding

through populations, mining claims at or near several populations, road repair projects, and livestock grazing and trampling (NatureServe 2013).

There are presently seven (16% of known) occurrences of Malheur prince's plume within 5 miles of the Proposed Action in Baker and Malheur Counties, including two occurrences of this species within the right-of-way of the Proposed Action, one occurrence within the right-of-way of the Willow Creek Alternative and one occurrence within the right-of-way of the Timber Canyon Alternative. Current population statuses are unknown.

MOONWORT (OREGON BLM SENSITIVE, USFS SENSITIVE)

Moonwort (*Botrychium lunaria*), also known as common moonwort, is a worldwide species. Found (in Oregon) along logging roads, in logged coniferous forest and other clearings and in alpine meadows; in damp turf and gravel; reported from 4,800 to 9,020 feet elevation; often associated with openings and meadows dominated by *Fragaria virginiana*, or in *Abies lasiocarpa* and *Pinus contorta* woodland openings. Its Global Status is G5 (secure), because while it can be locally rare, it is common across a very broad geographic range (NatureServe 2013). The closest occurrence of moonwort is 11.8 miles from the Proposed Action, near Limber Jim Ridge in Union County, but may occur in suitable habitats near the highest elevations of the Timber Canyon Alternative.

PRAIRIE MOONWORT (OREGON BLM SENSITIVE, USFS SENSITIVE)

Prairie moonwort (*Botrychium campestre*), also known as prairie dunewort, is a calciphile which occurs in 13 states and Canada. Found (in northeastern Oregon) in disturbed areas such as eroding river banks, gullies at the bases of old avalanche meadows and large open meadows; in well drained gravelly substrate; associated with relatively sparse vegetation dominated by *Fragaria* sp., sometimes with an overstory of *Abies lasiocarpa* and *Picea engelmannii* (CPNH 2013; Johnson-Groh 2007; NatureServe 2013). It has a Global Status of G3G4 (vulnerable), because it occurs over a fairly broad range, but it is rare in most of this range, with a few areas of modest concentration and several isolated, disjunct populations. However it is inconspicuous and difficult to locate, search efforts early in the spring, suitable for this species, will most likely reveal additional populations as well as provide better assessment of known populations (NatureServe 2013). Prairie moonwort is not known from closer than 22 miles from the Timber Canyon Alternative, but may occur in suitable habitats near the highest elevations of the Timber Canyon Alternative.

SLENDER MOONWORT (OREGON BLM SENSITIVE, USFS SENSITIVE)

Slender moonwort (*Botrychium lineare*), also known as narrow-leaved moonwort or narrowleaf grapefern, is a calciphile which occurs in twelve states and Canada. Found (in northeastern Oregon) in disturbed areas such as road ditches, gullies at the bases of old avalanches and eroding stream benches; in well drained gravelly substrate; associated with relatively sparse vegetation dominated by *Fragaria* sp., often with overstory of *Abies lasiocarpa* and *Picea engelmannii* (CPNH 2013; Johnson-Groh 2007; NatureServe 2013). It has a Global Status of G2G3 (imperiled) due to being one of several moonworts with a large range, but with sporadically occurring, widely separated, and extremely small populations. The total number of individuals so far observed throughout North America is very low -

several hundred at most. However, the species is difficult to survey for, and can exist below ground for most of its life cycle. *Botrychium lineare* is currently known from about 16 to 19 widely disjunct sites (NatureServe 2013). The closest known occurrence of slender moonwort is in Wallowa County, Oregon, 19.5 miles from the Timber Mountain Alternative, but may occur in suitable habitats near the highest elevations of the Timber Canyon Alternative.

TWIN-SPIKED MOONWORT (OREGON BLM SENSITIVE, USFS SENSITIVE, STATE CANDIDATE)

Twin-spiked moonwort (*Botrychium paradoxum*) occurs in 8 states and Canada. It is found in montane to subalpine grasslands or forb-dominated meadows (CPNH 2013; NatureServe 2013; OBIC 2013). It has a Global Status of G3G4 (vulnerable), due to being widely distributed but uncommon throughout its range. Although there is not a large number of occurrences and most populations are very small, it is probably often overlooked and more occurrences have been found with specific surveys and more are expected. It is threatened by grazing, trampling and off-road vehicle use. The closest known occurrence of twin-spiked moonwort is 17.5 miles from the Proposed Action in Baker County, but may occur in suitable habitats near the highest elevations of the Timber Canyon Alternative.

UPWARD-LOBED MOONWORT (OREGON BLM SENSITIVE, USFS SENSITIVE, STATE CANDIDATE)

Upward-lobed moonwort (*Botrychium ascendens*) is a calciphile which occurs in nine states and Canada. Found (in northeastern Oregon) in disturbed areas such as old avalanche meadows, mesic banks of streams adjacent to flat limey meadows, large open dry meadows and adjacent to trails or roads; in well drained gravelly substrate; reported from 5,340 feet elevation; associated with relatively sparse vegetation dominated by *Fragaria virginiana*, sometimes with an overstory of *Abies lasiocarpa* and *Picea engelmannii* (CPNH 2013; Johnson-Groh 2007; NatureServe 2013). It has a Global Status of G3 (vulnerable), due to being widely scattered and appearing to be rare. However, due to the small size of the plants and the scattered habitat, this species may be more abundant than presently known (NatureServe 2013). The closest occurrence of upward-lobed moonwort is over 14 miles from the Proposed Action in Baker County, but may occur in suitable habitats near the highest elevations of the Timber Canyon Alternative.

WESTERN MOONWORT (OREGON BLM SENSITIVE, USFS SENSITIVE)

Western moonwort (*Botrychium hesperium*) occurs in 8 states and Canada. Found (in northeastern Oregon) in bare forest patches, bare spots in logged forests, sparsely vegetated depositional areas of rocky creeks and intermittent streams, banks of creeks, roadsides adjacent to woodlands, small meadows, mesic meadows and flat limey meadows; in granitic and volcanic rubble; reported from 4,800 to 5,340 feet elevation; associated with *Fragaria virginiana* openings mixed in woodlands dominated by various combinations of *Abies lasiocarpa*, *Picea engelmannii*, *Pinus contorta* or *Larix occidentalis* (CPNH 2013; NatureServe 2013). It has a Global Status of G4 (apparently secure), due to being known from over 120 occurrences thus far; with additional occurrences continue to be discovered in many parts of its broad range. Occurrences are very often small and isolated, with counts of aboveground

sporophytes rarely exceeding 100; however, additional gametophytes and juvenile sporophytes belowground may add to the size of many occurrences and provide some buffer from environmental stochasticity. Appears to strongly favor open habitats within a forested matrix; threats include succession on the one hand (and suppression of natural disturbances such as fire) and human activities associated with anthropogenically disturbed habitats on the other (e.g., potential herbiciding of roadside populations) (NatureServe 2013). The closest known occurrence of western moonwort is in Wallowa County, Oregon, 19.5 miles from the Timber Mountain Alternative, but may occur in suitable habitats near the highest elevations of the Timber Canyon Alternative.

CORDILLERAN SEDGE (OREGON BLM SENSITIVE, USFS SENSITIVE)

Cordilleran sedge (*Carex cordillerana*) occurs in five states and Canada; found (in northeastern Oregon) in roadcuts, river banks and floodplains extending onto lower slopes, deep shade near creeks; in duff over deep brown loamy soil, dark silt loam soil, large rocky dark mud, small to coarse gravels, basalt derived soils and dry to moist soils; reported from 1,720 to 5,750 feet elevation; associated with *Crataegus douglasii* Shrubland, *Philadelphus lewisii* Intermittently Flooded Shrubland, *Pinus ponderosa*/*Symphoricarpos albus* Woodland with and without *Pseudotsuga menziesii*, *Populus tremuloides*/*Alnus incana* Forest and *Abies grandis*/*Symphoricarpos albus* Forest (CPNH 2013; NatureServe 2013). Its Global Status is G3G4 (vulnerable), but lacks analysis by NatureServe of its conservation status. Cordilleran sedge is known from five occurrences within one mile of the Timber Canyon Alternative, the closest being 0.39 miles from the right-of-way on Red Ridge, Baker County and 0.4 miles from the right-of-way near Wisdom Creek, Union County. Current statuses of the populations are unknown.

CLUSTERED LADY'S-SLIPPERS (OREGON BLM SENSITIVE, USFS SENSITIVE, STATE CANDIDATE)

Clustered lady's-slippers (*Cypripedium fasciculatum*) occur in eight states, but rarely in Oregon and in small population sizes in northeastern Oregon. Found under filtered sunlight on northerly aspects in the lower third of the slope, around springs and along riparian zones; from 2,500 to 6,500 feet elevation (Brooks et al. 1991; CPNH 2013; NatureServe 2013). Its Global Status is G4 (apparently secure), due to species' large overall range and the number of known populations, which suggests that the taxon is not in immediate danger. However, the small size of most populations, their isolated nature, and the presence of conflicting land uses warrant concern for the species' long-term survival throughout its range. Idaho population numbers are unknown. In Oregon, there are 10 occurrences with 100 or 100+ plants noted (NatureServe 2013). The nearest documented occurrence of clustered lady's-slippers is more than 6.3 miles from the Timber Mountain Alternative, but may occur in suitable habitats extending along the Timber Mountain Alternative.

MOUNTAIN MOONWORT (OREGON BLM SENSITIVE, USFS SENSITIVE)

Mountain moonwort (*Botrychium montanum*), also known as mountain grape-fern, is known from six states and Canada. This species is known to occur in 10 counties in Oregon, including Union and Baker Counties (ORBIC 2010b). It is found (in northeastern Oregon) in grassy alpine ridgetops, riparian

meadows along perennial streams, seeps and springs; reported from 3,800 to 8,112 feet elevation; associated (in Union County) with plant communities dominated by saplings of *Picea engelmannii* and *Larix occidentalis*, as well as in *Picea engelmannii*/*Carex aquatilis* Wooded Herbaceous Vegetation, *Poa pratensis* Semi-natural Seasonally Flooded Herbaceous Vegetation and *Pinus contorta*/*Vaccinium scoparium* Forest associations (CPNH 2013; NatureServe 2013; OFP 2012; ORBIC 2010b). In Idaho and Montana parts of its range, it has been reported to be closely associated with mature to old-growth western red cedar (NatureServe 2013). Its Global Status is G3 (vulnerable), due to the number of occurrences being high (about 100-200), but the total number of plants is rather low, from 2,500 to 10,000 individuals. Many of the populations may be protected from logging because they are located within riparian buffer zones although grazing would still be a threat (NatureServe 2013).

Mountain moonwort is presently known within 1.7 miles of the Timber Canyon Alternative, near Big Creek, Union County. Current population status is unknown.

RETRORSE SEDGE (OREGON BLM SENSITIVE, USFS SENSITIVE)

Retorse sedge (*Carex retrorsa*), also known as knotsheath sedge, is found in 26 states and Canada. It is found (in B2H Project area counties) along a creek and in a riparian zone; reported from 640 to 3,000 feet elevation; associated with *Alnus incana* Shrubland and/or *Crataegus douglasii* - (*C. chrysocarpa*) Shrubland (CPNH 2013; NatureServe 2013; OFP 2012; ORBIC 2010b). Associated plants include: *Crataegus douglasii*, *Alnus incana*, *Veratrum californicum*, *Equisetum* sp., *Populus* sp., *Solanum* sp., and *Athyrium filix-femina*. It has a Global Status of G5 (secure), but hasn't been analyzed by NatureServe for its conservation status. Retorse sedge is known within 1.2 miles of the Timber Canyon Alternative in Baker County. Current population status is unknown.

STALKED MOONWORT (OREGON BLM SENSITIVE, USFS SENSITIVE, STATE CANDIDATE)

Stalked moonwort (*Botrychium pedunculosum*) occurs in six states and Canada. It is found (in eastern Oregon) on sparsely vegetated depositional areas of small creeks, clearings in coniferous woodlands and small meadows; in granitic and volcanic rubble and in organic soils; reported from 4,132 to 5,500 feet elevation; associated with *Fragaria virginiana*, occasionally in or near to *Pinus contorta* woodlands (CPNH 2013; NatureServe 2013). Its Global Status is G2G3 (imperiled), due to approximately 41-56 extant occurrences, mostly from Washington, Montana, and Oregon. Most occurrences are small in size (median 5-8 plants) and the total population may not be more than 2000-3000 plants. Threats include cattle grazing, road building and maintenance, timber harvesting, recreational activities, and possibly fire suppression resulting in successional takeover of sites. Habitat is rather broad and more plants are expected to be found (NatureServe 2013). The closest known occurrence of stalked moonwort is 5.4 miles from the Timber Mountain Alternative, in Baker County, but may occur in suitable habitats near the highest elevations of the Timber Canyon Alternative.

1 *LEAST PHACELIA (OREGON AND IDAHO BLM SENSITIVE, USFS SENSITIVE,*
2 *STATE CANDIDATE)*

3 Least phacelia (*Phacelia minutissima*), also known as small phacelia, is known from from three
4 counties in Oregon (including Union), three counties in Idaho (including Owyhee), as well as
5 Washington and Nevada (USDA 2012). This phacelia is uniquely found in springs, wet areas, open,
6 semi-wet forb/grass meadows, moist flats and on rocky outcrops; in clay loam soil, gravelly soils, rocky
7 soils and sandy or sandy-gravelly basalt soils; on; *Veratrum* / low forb community on gravelly soil;
8 reported from 5,278 to 7,545 feet elevation; often associated with *Veratrum californicum* and *Populus*
9 *tremuloides* in a variety of vegetation communities including *Populus* / *Prunus-Alnus* / *Veratrum*
10 Woodland; *Populus tremuloides* / drummond / willow open forb Woodland; *Populus tremuloides* / forb-
11 grass Woodland; *Populus tremuloides* / *Salix–Artemisia* Woodland; *Artemisia tridentata* / *Veratrum*
12 Shrubland, *Populus tremuloides* / *Veratrum*–forb Woodland, and dense *Populus tremuloides*–mixed
13 conifer / *Salix* Forest (Atwood 2000; CPNH 2013; IRHN 2013; NatureServe 2013; OFP 2012; ORBIC
14 2010a). Least phacelia has a Global Status of G3 (vulnerable). Surveys from 1995 in adjacent
15 southwestern Idaho and northern Nevada found 30 new populations, many of which are very large
16 (NatureServe 2013). The nearest occurrence of least phacelia is within 3.5 miles of the Timber Canyon
17 Alternative, north of Big Creek in Baker and Union Counties.

18 *RED-FRUITED LOMATIUM (OREGON BLM SENSITIVE, USFS SENSITIVE,*
19 *STATE ENDANGERED)*

20 Red-fruited lomatium (*Lomatium erythrocarpum*) is also known as redfruit desertparsley. Habitats for
21 herbarium specimens and recorded observations of red-fruited lomatium include: on granodiorite
22 gravels and stable talus; sandy-stony soil, near bare small-sized talus, 30% slope; south-facing slopes
23 (OFP 2012). NatureServe (2012) also reports it from: dry, moderately steep, south- and east-facing (full
24 sun exposure) slopes and ridges; substrate is sandy-stony soil, loose gravel, and talus, derived from
25 granodiorite; distribution suggests an avoidance of calcareous substrates; generally found in open
26 areas. Associated plant communities (NatureServe 2013) are described as: in the ecotone between
27 shrub-steppe vegetation, dominated by *Cercocarpus ledifolius–Artemisia tridentata* Woodland and
28 *Pinus albicaulis–Picea engelmannii* Woodland. Associated plants include: *Artemisia tridentata*, *Viola*
29 *purpurea*, *Castilleja applegatei*, *Polygonum phytolaccifolium*, *Linum lewisii*, *Selaginella watsonii*,
30 *Lomatium cusickii*, *Lupinus caudatus*, *Haplopappus greenei*, *Haplopappus lyallii*, *Phlox austromontana*,
31 *Pteryxia terebinthina*, *Kellogia galioides*, *Viola purpurea*, *Viola adunca*, *Trisetum spicatum*, and *Pinus*
32 *albicaulis*. Reported elevational range is 2319 to 2600 meters and it is occasionally recorded as locally
33 abundant (OFP 2012).

34 Red-fruited lomatium has a Global Status of G1G2 (critically imperiled). It is known only from 11
35 occurrences in a very local area (about 13 sq. km.), where narrowly endemic to Elkhorn Ridge, a small,
36 high elevation area of the Blue Mountains in Baker County, Oregon. All known occurrences are on U.S.
37 Forest Service land. Surveys have covered most of the extremely limited potential habitat and only six
38 relatively small populations have been documented; large additional populations are not likely to be
39 found. However, searches elsewhere in the Elkhorn Ridge area, the Strawberry Mountains, and the
40 south flank of the Wallowa Mountains could be particularly fruitful. The primary threats are pika

herbivory, talus slides, and trampling by Rocky Mountain goats, introduced to the area in the early 1980s. Climate change also threatens this restricted alpine species; low snow pack may already be causing years of low plant numbers (NatureServe 2013). Suitable habitat for this species is not known to occur within the Proposed Action or alternatives. Thus, no further action is needed.

CRONQUIST'S STICKSEED (OREGON BLM AND STATE THREATENED)

Cronquist's stickseed (*Hackelia cronquistii*), also known as Cronquist's forget-me-not, is known only from Oregon and Idaho, limited to within a twenty-mile radius of Vale, Malheur County. Found on low and rolling sandy (dry) hills and at the base of sand dunes from north, and east north-east aspects, with the majority of plants and mid or lower slopes; in sandy loam, sand, light clay soils; reported from 2,200 to 3,640 feet elevation; locally common in the following vegetation associations: *Artemisia tridentata* / *Poa secunda* Shrubland, *Artemisia tridentata* / *Poa secunda*-*Pseudoroegneria spicata* Shrubland, *Artemisia tridentata*-*Purshia tridentata* / *Pseudoroegneria spicata*-*Poa secunda*-*Achnatherum hymenoides* Shrubland and *Artemisia tridentata* / *Bromus tectorum*-*Poa secunda*-*Festuca idahoensis*-*Achnatherum hymenoides* Semi-natural Shrubland. (OFP 2012; NatureServe 2013).

Its Global Status is G3 (vulnerable), due to being a regional endemic with about 52 populations known with a total of 28,000 to 61,000 plants. This species is found mainly near the eastern border of Oregon in Malheur and Baker Counties, and adjacent Idaho. Threats are from cattle grazing/trampling, herbicide use, competition from weedy species, and agricultural expansion, although it is fairly resistant to casual disturbance (NatureServe 2013).

There are presently multiple known occurrences of Cronquist's stickseed in Malheur County in the right-of-way of the Proposed Action and alternatives, with seven known occurrences within the right-of-way of the Proposed Action, many additional occurrences within 0.5 miles of the Proposed Action, one occurrence in the right-of-way of the Double Mountain Alternative, four occurrences in the right-of-way of the Malheur S Alternative, and an occurrence within 0.13 miles of the Tub Mountain Alternative. Current statuses of the populations are unknown.

SNAKE RIVER GOLDENWEED (OREGON BLM SENSITIVE, STATE ENDANGERED)

Snake River goldenweed (*Pyrrocoma radiata* syn. *Haplopappus radiata*), also known as ray goldenweed, is endemic to Idaho and Oregon on the lower confines of the Snake River Canyon and adjacent slopes. Found on xeric scablands with scant vegetation, ridges, a cemetery (disturbed and undisturbed areas), moderately steep, mostly south-facing slopes, moist slopes; in grey shale, shallow coarse stony or rocky basalt derived soils; reported from 2,320 to 5,400 feet elevation; associated with the following community types: *Artemisia tridentata*-*Purshia tridentata* / *Pseudoroegneria spicata*-*Leymus cinereus*-*Bromus tectorum* Shrubland, *Rosa* sp.-*Artemisia tridentata* / *Pseudoroegneria spicata*-*Poa sandbergii* Shrubland and *Pseudoroegneria spicata* Herbaceous Vegetation (IRHN 2013; NatureServe 2013; OFP 2012). It has a Global Status of G3 (vulnerable), due to being known from 69 total occurrences in a restricted range. Threatened by overgrazing, which has caused mass introduction of annual grasses. Damage from grasshoppers is also important. Also threatened by conversion of land to agriculture, water level fluctuations at Brownlee Reservoir, road construction and

1 maintenance, and mining operations. Most of the populations occur on federal lands (NatureServe
2 2013). There are presently 38 (55% of known) occurrences of Snake River goldenweed within 5 miles
3 of the Proposed Action, Willow Creek and Tub Mountain South Alternative in Baker and Malheur
4 Counties, with the closest occurrence in the right-of-way of the Willow Creek Alternative. Current
5 population statuses are known for only eleven populations.

6 *GOLDEN BUCKWHEAT (OREGON BLM SENSITIVE, STATE THREATENED)*

7 Golden buckwheat (*Eriogonum chrysops*) is only found in the Dry Creek drainage of Malheur County,
8 Oregon. It grows in on ridges and barren lava flows: in thin sandy soil, loam, shallow gravelly to rocky
9 soil and basalt rock; reported from 4,230 to 5,150 feet elevation; in sparsely vegetated areas and
10 scablands characterized as *Artemisia arbuscula* Shrubland (CPNH 2013; NatureServe 2013). Its Global
11 Status is G2 (imperiled), due to being a narrow endemic prsenetly known from only five populations
12 believed to contain approximately 34,000 individuals in total. Threats appear minor and include off-road
13 vehicle use and minor habitat modification due to livestock grazing (NatureServe 2013). There are
14 presently no known occurrences of golden buckwheat within 20 miles of the B2H Project area, but it
15 may occur since suitable habitat is present.

16 *GREELEY'S WAVEWING (OREGON AND IDAHO BLM SENSITIVE)*

17 Greeley's wavewing (*Cymopterus acaulis* var. *greeleyorum* syn. *Cymopterus glomeratus* var.
18 *greeleyorum*), also known as Greeley's springparsley, is only known from three Idaho and Oregon
19 counties. Found on sparsely vegetated slopes and hillsides, tops of hills; in deep sand, unconsolidated
20 white to brown ash, heavy bentonite ash-clay and clay soils; reported from 2,800 to 4,000 feet
21 elevation; associated with the following alliances and associations: *Acnatherum hyminoides*
22 Herbaceous Vegetation and *Artemisia tridentata* / *Leymus cinereus* Shrubland (CPNH 2013; IRHN
23 2013; NatureServe 2013). Its Global Status is G5T2 (imperiled), but NatureServe has not done an
24 analysis of its conservation status. Greeley's wavewing is presently documented within 0.8 miles of the
25 Proposed Action near Graveyard Point in Owyhee County. Current population status is unknown.

26 *JANISH'S PENSTEMON (IDAHO BLM SENSITIVE)*

27 The Janish's penstemon (*Penstemon janishiae*) occurs in four states; found (in Malheur and Owyhee
28 Counties) on sandy bluffs, shale slopes, layered and north-facing hillsides, in deep soil on north slopes
29 and in open, grassy prairies; reported from 2,798 to 2,916 feet elevation; associated with the following
30 vegetation types: *Atriplex confertifolia* - (*Salvia dorrii*) - *Chrysothamnus viscidiflorus* Shrubland, *Atriplex*
31 *confertifolia* - *Salvia dorrii* Shrubland, and *Atriplex confertifolia* / *Achnatherum hymenoides* Dwarf-
32 shrubland (CPNH 2013; IRHN 2013; NatureServe 2013). Its Global Status is G4 (apparently secure),
33 due to its wide geographical range (NatureServe 2013). There are five occurrences of Janish's
34 penstemon within 5 miles of the Proposed Action Action in Owyhee County, with the closest occurrence
35 located near Reynolds Creek Road, 3.2 miles from the right-of-way. Current population statusus are
36 unknown.

MALHEUR CRYPTANTHA (IDAHO BLM SENSITIVE)

Malheur cryptantha (*Cryptantha propria*) only occurs in Oregon and Idaho. It is found on cliffs, ledges, bluffs, dry slopes, ridges, buttes, rocky outcrops, roadcuts and open flats of any exposure; in sandy, clay, oolitic limestone or dolomite and ash/rhyolite (volcanic) soils, as well as loose rock and stony or gravelly thin soils; reported from 2,100 to 4,800 feet in elevation; associated with plant communities dominated wholly by, or with various combinations of: *Cercocarpus ledifolius*, *Artemisia arbuscula*, *Artemisia tridentata* ssp. *wyomingensis*, *Picrothamnus desertorum*, *Purshia tridentata*, *Atriplex confertifolia*, *Ephedra viridis*, *Achnantherum hymenoides*, *Pascopyrum smithii* and *Pseudoroegneria spicata* (CPNH 2013; IRHN 2013; NatureServe 2013). It has a Global Status of G4 (apparently secure), due to a small to moderate number of occurrences, abundance and range, with moderate threats from mining and grazing, but apparently healthy populations (NatureServe 2013). Suitable habitat for Malheur cryptantha exists within the B2H Project area and is likely to occur, but no specimens or occurrence data is known.

MALHEUR VALLEY FIDDLENECK (OREGON BLM SENSITIVE, STATE THREATENED)

Malheur Valley fiddleneck (*Amsinckia carinata*) is an Oregon endemic only known from the Harper Valley area of Malheur River, in northern Malheur County. It is found on upper slopes of rocky, yellow welded tuff (volcanic) hills, mostly on southern exposures; in loose or partially consolidated scree, talus covered with cobble, heavy gravel, rock fragments and pockets of deep, black soil; reported from 2,740 feet elevation; associated with the *Atriplex spinosa* / *Hordeum jubatum* Semi-natural Shrubland (NatureServe 2013; OBIC 2012; OFP 2012). It has a Global Status of G2 (imperiled), due to only six occurrences being known. At these few sites, the plants may be numerous in years of adequate rainfall. This species was thought to be extinct; it had not been seen since 1896 when it was rediscovered in 1984. It is intolerant of disturbance and is threatened by grazing and agriculture (NatureServe 2013). There are no known occurrences of Malheur Valley fiddleneck within 9.5 miles of the Proposed Action or alternatives, but it may occur on suitable habitat.

MALHEUR YELLOW PHACELIA (IDAHO BLM SENSITIVE)

Malheur yellow phacelia (*Phacelia lutea* var. *calva*), also known as Owyhee phacelia or Malheur phacelia, occurs only in Malheur County, Oregon and Owyhee County, Idaho. Found on hillsides, denuded chalky or open white clayey scabland, moist highway cuts and loose, fraible, alkaline clay banks; in lacustrine ash, dry ash-clay deposits, volcanic tuff; barren white-ash, montmorillonite clay and lithosol soils; reported from 3,740 to 4,300 feet elevation; associated with *Artemisia arbuscula*-*Artemisia spinescens* / *Bromus tectorum* Semi-natural Shrubland (CPNH 2013; IRHN 2013; NatureServe 2013; OFP 2012). Its Global Status is G4T3 (vulnerable), due to being a regional endemic with only 15-30 occurrences and locally abundant in years of average rainfall. Threats are from mining and its habitat being used by off-road vehicle recreationists. Plants have more difficulty germination on clay compacted by off-road vehicle users (NatureServe 2013). Malheur yellow phacelia occurs within 1.6 miles of the right-of-way of the Proposed Action near Wilson Creek in Owyhee County. Current population status is unknown.

1 *MULFORD'S MILK-VETCH (OREGON AND IDAHO BLM SENSITIVE, STATE*
2 *ENDANGERED)*

3 Mulford's milk-vetch (*Astragalus mulfordiae*) is known only from Idaho and Oregon, where found on
4 deep sandy first river terraces, sandy beaches, gravel bars, flat to gently rolling south-east exposures,
5 sand bowls at the crest of hills, old river deposits, sandy places near rivers, sandy bluffs and dunelike
6 talus in foothills; in decomposed sandstone, decomposed oolitic limestone, deep sand derived from
7 lake deposits, lacustrine ash and sand to sandy loam; reported from 2,100 to 3,200 feet elevation;
8 associated with shrub-steppe and desert shrub communities (CPNH 2013; IRHN 2013; NatureServe
9 2013; OFP 2012). Its Global Status is G2 (imperiled), due to being a narrow endemic with the majority
10 of known populations are small in number of plants and in extent. Threats include habitat destruction
11 and degradation due to residential and agricultural development, sand mining, off-road vehicle activity,
12 and livestock grazing, which have taken place in nearly all known populations (NatureServe 2013).

13 Mulford's milk-vetch is documented from within 1.2 miles of the Proposed Action in the Hemingway
14 Butte area of Owyhee County, and various places from the right-of-way of the Malheur S Alternative:
15 within 0.1 miles in the Four Points Reservoir area, within 1 miles at Cow Hollow, within 1.4 miles near
16 Vine Hill, within 1.7 miles near Big Cut Reservoir and within 1.2 miles of the Action crossing over the
17 Owyhee River. Current population status is unknown.

18 *OWYHEE CLOVER (OREGON BLM SENSITIVE, USFS SENSITIVE, STATE*
19 *ENDANGERED)*

20 Owyhee clover (*Trifolium owyheense*) is a regional endemic to Owyhee uplands in northern Nevada,
21 Malheur County, Oregon and Owyhee County, Idaho. It is found in washes, on barren slopes and
22 mounds composed of talus and loose, coarse-grained, crumbly soils derived from rhyolitic ash parent
23 material; in exposures of soft white ash weathering to clay, light yellow-green ash-tuff and gravelly clay
24 alluvium derived from Tertiary ash flow tuffs and conglomerates; from 2,720 to 4,950 feet elevation;
25 associated with plant communities generally dominated by sparse sagebrush, juniper, and
26 bunchgrasses (Gisler and Kaye 2004; IRHN 2013; NatureServe 2013; OFP 2012). Owyhee clover has
27 a Global Status of G2 (imperiled), due to being known from less 40 occurrences, although some
28 populations are estimated at tens of thousands of leaves, with up to hundreds of thousands in one
29 case. This species is a regional endemic to Owyhee uplands in Malheur County, Oregon and Owyhee
30 County, Idaho, as well as and northern Nevada. It is found in Malheur County at Lower Leslie Gulch,
31 Slocum Creek, Dago Gulch and Grassy Ridge. Threats are competition by invasive species, including
32 medusahead wildrye and Scotch thistle; livestock grazing; herbivory by rabbits, deer, horses, and
33 cows; off-road vehicles; and potential mineral development (NatureServe 2013). There are no known
34 occurrences of Owyhee clover within 8 miles of the Proposed Action or alternative Actions, but it may
35 occur since suitable habitat is present.

36 *SALTWORT BUCKWHEAT (OREGON BLM SENSITIVE)*

37 Saltwort buckwheat (*Eriogonum salicornioides*), also known as saltwort wild buckwheat and playa
38 buckwheat, is known from Idaho and Oregon. It is found on any aspect and slope position, banks above

a draw and chalky scablands; on white to grey ash outcrops, clay and sandy loam soils; reported from 2,500 to 4,300 feet elevation; associated with desert shrub plant communities dominated wholly by, or with various combinations of: *Artemisia* sp., *Atriplex confertifolia*, *Atriplex argentea* and *Purshia tridentata* (CPNH 2013; NatureServe 2013). It has a Global Status of G3G4 (vulnerable), because there are 30 reported sites with more occurrences likely in Idaho and Nevada. Plant numbers for some of the sites are noted as very large; threats appear to be minimal. Some of the sites are disturbed, but are assumed to be fairly resistant to mild disturbances (NatureServe 2013). There is presently a comparatively large population of 500 plants of Saltwort buckwheat in a 0.25-acre area, 0.07 miles from the right-of-way of the Double Mountain Alternative. Since suitable habitat is present, it may occur in Idaho and elsewhere in Oregon.

STERILE MILK-VETCH (OREGON AND IDAHO BLM SENSITIVE, STATE THREATENED)

Sterile milk-vetch (*Astragalus cusickii* var. *sterilis*), also known as stiff milk-vetch, barren milk-vetch or Cusick's milk-vetch, is known only from Idaho and Oregon. It is found on a variety of habitats including: below rhyolite cliffs, bottom of a talus slope, slopes and hillsides, roadcuts through rhyolite and ash, roadsides, river gravel bars, banks of dry creek beds, dry washes, dry hillsides, sandstone and ash deposits; in soft yellow-pink ash, whitish-grey volcanic ash, brown clay, sand white volcanic ash, ash and clay conglomerate, orange sands and gravels, brownish and yellow-green ash-tuft and rocky ash soils; reported from 2,700 to 4,800 feet elevation; plant communities to which sterile milk-vetch is associated include sagebrush-steppe, in sparse vegetation adjacent to sagebrush and desert scrub and in *Grayia spinosa*-*Eriogonum* sp. / *Hordeum jubatum*-*Pseudoroegneria spicata* Semi-natural Shrubland association (CPNH 2013; IRHN 2013; NatureServe 2013; OFP 2012). Its Global Status is G5T2 (imperiled), because it has a very restricted range in vulnerable habitat; 72 historic occurrences, a few that are quite large, but with mining threats. Many of the occurrence records mention mining stakes being seen. This species could possibly be a G3 but with such a large and encompassing threat as mining, NatureServe considers that it merits a G2. Even if populations are found within protected areas or protected areas are drawn around populations, mining may still be an allowable activity (NatureServe 2013). Sterile milk-vetch is presently documented from within 0.6 miles of the B2H Project area in the canyon of the Owyhee River. Current population status is unknown.

STIFF MILK-VETCH (IDAHO BLM SENSITIVE)

Stiff milkvetch (*Astragalus conjunctus* var. *conjunctus*), also known as Idaho milkvetch, occurs in Oregon, Idaho and Wyoming. It is found (in B2H Project area counties) on grassy roadsides, dry woods in fine and deep soils, rocky rhyolite slopes, steep banks in badlands along creeks, loose stony soil of canyon sides, meadows above lakes and slopes above stock ponds, and gravelly scab rock or windswept flats; reported in loamy clay and loam soil; from 2,540 to 7,598 feet elevation; associated with plant communities dominated wholly by, or with various combinations of: *Artemisia arbuscula*, *Artemisia packardiae*, *Artemisia tridentata* ssp. *wyomingensis*, *Artemisia rigida*, *Festuca idahoensis*, *Poa sandbergii*, *Poa secunda* and *Pseudoroegneria spicata* (CPNH 2013; IRHN 2013; NatureServe 2013). NatureServe has not assigned a Global Status to this variety, nor done an analysis of its

conservation status. Stiff milkvetch is known 1.4 miles from the right-of-way of the Proposed Action in Jump Creek Canyon and 3.36 miles away near French John Hill. Current population status is unknown.

BASIN GOLDENROD (IDAHO BLM SENSITIVE)

Basin goldenrod (*Solidago spectabilis*) is also known as spectacular goldenrod or Nevada goldenrod. It occurs in six states although it is apparently extirpated in Idaho; rarely collected from B2H Project area counties, where documented only from Sucker Creek Canyon in Malheur County; elevation, soils and plant communities affinities are unknown (CPNH 2013; IRHN 2013; NatureServe 2013). Its Global Status is G4 (apparently secure), thus hasn't been analyzed by NatureServe for conservation status. The nearest specimen collection of basin goldenrod is 5.5 miles from the Proposed Action, but may occur in suitable habitat extending to the Proposed Action nearer to the Succor Creek crossing. Current status and extent of the population is unknown.

BIGELOW'S FOUR-O'CLOCK (IDAHO BLM SENSITIVE)

Bigelow's four-o'clock (*Mirabilis laevis* var. *retorsa*) is also known as wishbone-bush and the scientific name *Mirabilis bigelovii* var. *retrorsa*. Bigelow's four-o'clock is known from California, Nevada, Utah and Arizona, with Oregon on the edge of its range (NatureServe 2013). In Oregon it is only known from Malheur and Harney Counties (USDA 2013). Specimens and observation records of Bigelow's four-o'clock have been made at approximately 732 meters elevation, in the following habitats: soft, yellow pink ash; red cinder slope; rocky wall of Owyhee Canyon; and the base of rhyolite cliffs (OFP 2012). Its Global Status is G4G5T4 (apparently secure), thus hasn't been analyzed by NatureServe for conservation status. There are six known occurrences are within 5 miles of the Proposed Action, Malheur S Alternative and Malheur A Alternative in Malheur County. Current statuses of the populations are unknown.

GRIMY IVESIA (OREGON BLM SENSITIVE, STATE ENDANGERED)

Grimy ivesia (*Ivesia rhypara* var. *rhypara*), also known as grimy mousetail, occurs in occurs in Lake and Malheur Counties, Oregon and Elko and Washoe Counties, Nevada. It is found (in Oregon) on roadsides, barren scree slopes, and cracks of white, yellow and apricot colored ash-tuft; in gravelly soil; reported from 3,900 to 4,600 feet elevation; associated with plant communities dominated in the overstory by *Juniperus occidentalis* and a variety of understory species which vary by site (CPNH 2013; IRHN 2013; NatureServe 2013; OFP 2012). Grimy ivesia has a Global Status of G2T2 (imperiled). There are only 4 occurrences known in Oregon with an estimated total of <1100 plants. Much of southeastern Oregon was searched in particular for this taxa in 1979 and 1980 and no new populations were found. No sites are fully protected from its two major threats, mining and trampling (cattle and human) even though 3 are found within an Area of Critical Environmental Concern and Research Natural Area. Eleven Nevada populations reported as about 200,000 individuals on 45 acres of habitat (as of 1/99). Total population acreage is less than 2000. Trampling of the *Ivesia's* habitat may lead to seriously impact. It has adapted to the shallow, rubble layer on which it grows by developing a long and branching root system that allows it to creep between the rubble and the bedrock (NatureServe 2013).

There are no known occurrences of grimy ivesia within 12.8 miles of the Proposed Action or alternative Actions, but it may occur since suitable habitat is present.

PACKARD'S DESERT PARSLEY (IDAHO BLM SENSITIVE)

Packard's deserparsley (*Lomatium packardiae*), also known as Succor Creek parsley, is known from three states. Found (in Idaho) on sparsely vegetated mixed ash/loam slopes and toe slopes, open vernal wet pockets on slopes, barren west-facing scree slopes in Succor creek ash, on sandstone deposits; in brown and white ash and ashy soils, rhyolitic rock, clay loam soil around ash outcrops, loamy soils and rocky heavy clays; reported from 3,051 to 5,102 feet elevation; lacking documentation of associated plant communities, although sometimes associated with *Artemisia* sp. and *Juniperus* sp. (CPNH 2013; IRHN 2013; NatureServe 2013). Packard's deserparsley has a Global Status of G2 (imperiled), due to only seven known sites and very narrow habitat preference. It is vulnerable to mineral exploration and development, livestock trampling, and off-road vehicle use (NatureServe 2012). There are presently no known occurrences of Packard's desert parsley within 5.2 miles of the Proposed Action or alternative Actions, but it is likely to occur near the crossing of the Proposed Action at Succor Creek since suitable habitat is present.

PACKARD'S MENTZELIA (STATE THREATENED)

Packard's mentzelia (*Mentzelia packardiae*), also known as Packard's blazingstar, a narrow endemic of extreme east-central Malheur County, with five occurrences along a five mile long canyon. It is found on shale talus, steep hillsides, mesic northern exposures, at bases of talus slopes and cliffs; in yellow and yellow-green ash-tuft talus, green to yellow rocky clay, volcanic ash with high montmorillinite content, fine gravel talus, crumbling rock and in clay pebbles; reported from 2,860 to 4,440 feet elevation; lacking data on associated plant communities (CDC 2012; CPC 2012; CPNH 2013; NatureServe 2013; OFP 2012). This species grows in extremely dry soils with high potassium content (CDC 2012). It has a Global Status of G2Q (imperiled), due to being a narrow endemic. Threats include off-road vehicle use, trampling and mining the ash for use in road construction. The known extant populations of Packard's mentzelia in Oregon fluctuates with rainfall, with an estimated range in size per site from 50 to approximately 9,000 individuals, for a grand total of 12,000 to 20,000 (CPC 2012; NatureServe 2013). There are no known occurrences of Packard's mentzelia within 21 miles of the Proposed Action or alternative Actions. Thus, no further action is needed.

PACKARD'S WORMWOOD (NO STATUS)

Packard's wormwood (*Artemisia packardiae*) is narrowly endemic to the Owyhee River and its tributaries, although known from Nevada, Idaho and Oregon. Oregon specimens of Packard's wormwood have been collected, or the plant observed, between 884 to 1433 meters elevation in the following habitats: volcanic rock; cracks in rhyolite; rhyolite rocks along river; in cracks at the base of Jump Creek Rhyolite and Sucker Creek Formation basaltic dikes; in sheltered places on cliff faces of basalt (or perhaps other geologic types), including the scree below cliffs; moist shaded rock outcrop; shaded, damp north-facing wall of canyon; fully shaded, north-facing slope of slot canyon, drier areas below meadow. Reported to be associated with: *Prunus virginiana*, *Heuchera rubescens*, *Ribes* sp.,

Carex sp., *Brickelia oblongifolia*, *Potentilla* sp., *Thelypodium* sp., *Ivesia baileyi*, *Muhlenbergia mexicana*, *Anthrrium alpestre*, *Galium trifolium*, *Rumex acetosella*, *Rubus idaeus*, *Poa* sp., *Hackelia* sp., *Haplopappus nanus* (OFP 2012). It has a Global Status of G3 (vulnerable) due to only 17 known populations. Packard's wormwood is fairly-well protected and found in inaccessible places, where it appears hardy. Most Oregon occurrences have good population viability, with small to medium-sized populations (NatureServe 2013). There is a known occurrence of this species within 0.61 miles of the Malheur A Alternative. Current population status is unknown.

SMOOTH MENTZELIA (SMOOTH STICKLEAF) (OREGON AND IDAHO BLM SENSITIVE, STATE ENDANGERED)

Smooth mentzelia (*Mentzelia mollis*), also known as soft blazingstar, occurs in three states. Found (in Idaho and Oregon) on a variety of habitats, including along a stream path, on outcrops and knobs and on slopes of hillsides; typically in ash soils derived from the Succor Creek Formation, also in white, green, grey and pale eroded clay, nearly barren volcanic ash-clay, unconsolidated and decomposed ash, lithosol soils, bentonite, zeolite and montmorillonite; reported from 2,500 to 4,420 feet elevation; associated with *Artemisia tridentata*–*Sarcobatus vermiculatus* Shrubland, *Ericameria nauseosa*–*Artemisia tridentata* / *Elymus elymoides* Shrubland, often mixed in the understory with *Phacelia lutea*. (CPNH 2013; CPC 2012; IRHN 2013; NatureServe 2013; ODA 2012b; OFP 2012). Its Global Status is G2 (imperiled) due to being endemic to Succor Creek Formation ash/claybed outcrops of the Owyhee Desert, with disjunct populations in the Black Rock Desert area of northern Nevada. It is locally abundant on suitable substrate, when the substrate is available and not compacted. Oregon populations total at least 37,000 plants. Many occurrences are located in areas with mining claims. Habitat degradation threats include mineral exploration, off-road vehicle recreational activity, and range improvement programs. Smooth mentzelia does not germinate easily on compacted soil (e.g., by off-road vehicles). It does recolonize after disturbance if soil is permeable (NatureServe 2013). Smooth mentzelia is presently known within the right-of-way of both the Malheur A Alternative near North Alkali Draw Reservoir in Malheur County and the Proposed Action west of Rats Nest Gulch in Owyhee County. Current population statuses are unknown.

IDAHO PEPPERWEED (USFWS THREATENED)

Idaho pepperweed (*Lepidium papilliferum*), also known as slickspot peppergrass, was included as a federally threatened species on December 7, 2009 (74 FR 52014). Idaho pepperweed is found between 2,200 to 5,400 feet elevation in six counties in southwest Idaho, including in Owyhee County. Idaho pepperweed is found between 2,200 and 5,400 feet in elevation in six counties in southwest Idaho, including in Owyhee County. It grows in unique microsite habitats known as slickspots, which are found within the semiarid sagebrush-steppe ecosystem of southwestern Idaho. The species is endemic to this region, known only from the Snake River Plain and its adjacent northern foothills. It is found ephemerally wet microsites, typically in depressions that hold water in the spring. These are generally relatively small areas, from a few feet to a few thousand feet, and are located within sagebrush steppe. Dominant species in the surrounding habitat included *Artemisia tridentata* ssp. *wyomingensis*, *Achnatherum*

1 *thurberianum*, *Poa secunda*, *Agropyron spicatum*, and *Sitanion hystrix* (74 FR 52014). Perennial
2 vegetation is usually absent from areas inhabited by Idaho pepperweed.

3 Idaho pepperweed has a Global Status of G2 (imperiled), due to being endemic to southwestern Idaho,
4 where it is restricted to unique small-scale openings within sagebrush-steppe habitats. Twenty one
5 populations are known to be extirpated and many of the approximately 45 extant occurrences are small
6 and threatened by on-going habitat loss due to the degradation and loss of sagebrush-steppe
7 ecosystem on the western Snake River Plain. Conversion to irrigated agriculture,
8 urban/suburbanization, and the introduction of exotic annual grasses are considered by NatureServe to
9 be the major reasons for the decline (NatureServe 2013). The primary threat to Idaho pepperweed is
10 the present or threatened destruction, modification, or curtailment of its habitat and range due to the
11 increased frequency and extent of wildfires under a wildfire regime modified and exacerbated by the
12 spread of invasive nonnative plants, particularly nonnative annual grasses such as cheatgrass (*Bromus*
13 *tectorum*). In addition, even under conservative projections of the consequences of future climate
14 change, the threats posed by wildfire and the invasion of cheatgrass are expected to further increase
15 within the foreseeable future. Other threats to the species include competition and displacement by
16 nonnative plant species, development, potential seed predation by harvester ants, and habitat
17 fragmentation and isolation of small populations (USFWS 2009).

18 The USFWS has designated 23,374 acres of critical habitat for Idaho pepperweed in four counties in
19 Idaho, including Owyhee County, through which the Proposed Action crosses (50 Code of Federal
20 Regulations Part 17). However, neither the Proposed Action nor the alternative Actions cross lands
21 designated as critical habitat. There are no known occurrences of Idaho pepperweed within 5 miles of
22 the Proposed Action or alternative Actions. Thus, no further action is anticipated since neither the
23 Proposed Action nor the alternatives cross lands designated as critical habitat.

24 *CARVESEED (IDAHO BLM SENSITIVE)*

25 Carveseed (*Glyptopleura marginata*), also known as white-margined wax plant, is known in six states,
26 including Idaho and Oregon. It is found near the B2H Project area from sandy flats and rocky
27 windswept lava bluffs; in sandy flats and alkaline rock soils; reported from approximately 2,400 to
28 3,000 feet elevation; associated with the *Grayia spinosa* Shrubland vegetation alliance (CPNH 2012;
29 IRHN 2013; NatureServe 2013). Its Global Status is G4G5 (apparently secure), thus has not been
30 analyzed by NatureServe for conservation status. There are several known populations of carveseed
31 within 5 miles of the Proposed Action in Owyhee County, with the closest occurrence being 1.5 miles
32 from the right-of-way of the Proposed Action in the Reynolds Creek drainage. Current statuses of the
33 populations are unknown.

34 *CUSICK'S PINCUSHION (IDAHO BLM SENSITIVE)*

35 Cusick's pincushion (*Chaenactis cusickii*) is known only from the Owyhee River drainage of Malheur
36 County, Oregon and adjacent Owyhee County, Idaho. It is found in dry shrublands, on cliffs and on
37 barren knolls; in dry lithosol soils, chalk, diatomite, and pale, dark brown clay, brown ash, whitish to
38 yellowish to grey volcanic ash-clay soils, especially those of the Poison Creek and Succor Creek

Formations; reported between 2,460 and 4,265 feet elevation; associated with semi-natural *Picrothamnus desertorum* Shrublands with herbaceous dominance by either *Hordeum jubatum* or *Bromus tectorum*, *Artemisia arbuscula* / *Hordeum jubatum* Semi-natural Shrubland, as well as *Picrothamnus desertorum* / *Poa sandbergii* Shrublands (CPNH 2013; IRHN 2013; NatureServe 2013). Its Global Status is G3 (vulnerable), because it is a regional endemic that is locally abundant on suitable habitats. However, Idaho plant numbers total about 2500-3500 and Oregon totals 3500-13,500, represented in only fifteen occurrences in Malheur County and seven in Owyhee County. Mining claims and off-road vehicles are potential threats at many sites, with plants not found in soils compacted by ORV activity (NatureServe 2013). Cusick's pincushion is presently known from nine populations within 5 miles of the Proposed Action in Owyhee County and within approximately 1.15 miles of the Proposed Action near Hemingway Butte in Owyhee County. Current statuses of the populations are unknown.

DESERT PINCUSHION (IDAHO BLM SENSITIVE)

Desert pincushion (*Chaenactis stevioides*), also known as Esteve's pincushion or broad-flower pincushion, is native to nine states. It is found in cliffs and edges of plateaus, on slopes of river canyons; in white ash, gravelly and sandy soils; reported from approximately 2,400 to 4,600 feet elevation; in sparse desert scrub-shrub and salt desert scrub communities dominated by the following vegetation alliances: *Grayia spinosa* Shrubland, *Picrothamnus desertorum* Shrubland and *Atriplex confertifolia* Shrubland, occasionally with *Artemisia tridentata* co-dominant (CPNH 2013; IRHN 2013; NatureServe 2013). Its Global Status is G5 (secure), due to being common in Nevada and California. Desert pincushion is presently known within 1.1 miles from the right-of-way of the Proposed action in the Hemingway Butte area of Owyhee County, with an unverified historical occurrence near to the Succor Creek crossing of the Proposed Action in Malheur County.¹ Current population statuses are unknown.

DIMERESIA (IDAHO BLM SENSITIVE)

Dimeresia (*Dimeresia howellii*), also known as doublet, is found in four states, from broad flat summits and broad ridges; in alkaline soil, gravelly, dark gray volcanic ash, ash-tuff rubble, rocky gravelly soils and barren basalt gravels and cobbles; reported from 4,528 to 7,250 feet elevation; in the following vegetation alliances and associations: *Purshia tridentata* - *Artemisia tridentata* - *Chrysothamnus viscidiflorus* / *Poa secunda* Shrubland (CPNH 2013; IRHN 2013; NatureServe 2013; OFP 2012). Its Global Status is G4 (apparently secure), due to being common in the center of its range (Oregon and Nevada). In Idaho, it is known from only six occurrences. There is a herbarium specimen of dimeresia collected no closer than 4.1 miles from the Proposed Action in Shares Basin, Owyhee County. Current population status is unknown.

¹ Within 5 miles of Idaho, thus a population deemed by the BLM as important in determining cumulative effects on this species in Idaho.

1 *EARTH LICHEN (IDAHO BLM SENSITIVE)*

2 Earth lichen (*Catapyrenium congestum* syn. *Heteropladidium congestum*), also known as compact
3 earth lichen, occurs in four states. It is often found (within the B2H Project area counties) in unspecified
4 habitats, as well as habitats described as swales, canyons and hill tops; in moss, sandy soil, alkaline
5 clay-silt or sometimes saline soil, rarely on sandstone; reported from 3,500 to 4,790 feet elevation;
6 associated with grasslands, salt desert shrub (*Atriplex-Artemisia* and *Atriplex nuttallii-Grayia spinosa*)
7 and *Artemisia tridentata* ssp. *wyomingensis* dominated communities (CPNH 2013; NatureServe 2013).
8 Its Global Status is G4 (apparently secure), but lacks analysis by NatureServe of its conservation
9 status. Earth lichen is presently known within 4 miles of the Proposed Action in Owyhee County.
10 Current population status is unknown.

11 *RIGID THREADBUSH (IDAHO BLM SENSITIVE)*

12 Rigid threadbush (*Nemacladus rigidus*), also known as stoutstem threadplant, occurs in four states and
13 is found (in B2H Project area counties) in dry washes, sandstone scree, barren ridgetops, hillsides and
14 slopes of volcanic mesas; in barren brown sands, rhyolitic gravel, loose/soft brown volcanic ash, light
15 brown sand, fine-textured soil derived from basalt, dark sandy gravelly soils and white chalky ash;
16 reported from 2,950 to 5,300 feet elevation; associated plant communities are poorly documented, but
17 include *Artemisia tridentata* (probably ssp. *wyomingensis*) / *Pseudoroegneria spicata* Shrubland
18 (CPNH 2013, IRHN 2013, NatureServe 2013). It has a Global Status of G4 (apparently secure), due to
19 a moderate number of occurrences, moderate abundance and moderate range; with a low level of
20 threats from grazing, range improvement projects, and off-road vehicles (NatureServe 2013). Rigid
21 threadbush has been reported by the BLM within 5 miles of the Proposed Action in Owyhee County.
22 Although no specimen or observational records were found for verification, this plant is hard to find,
23 suitable habitat does exist and the species is likely to occur. Current population status is unknown.

24 *SIMPSON'S HEDGEHOG CACTUS (IDAHO BLM SENSITIVE)*

25 Simpson's hedgehog cactus (*Pediocactus simpsonii*), also known as mountain ball cactus, occurs in
26 twelve states (USDA 2013). It is found (in Idaho) in open plains, at top of limestone cliffs, open gravelly
27 knolls and wind-swept ridges; reported from 5,905 to 8,200 feet elevation; associated with pinyon-
28 juniper and sagebrush communities, including *Artemisia frigida* and *Artemisia arbuscula* (BLM 2011;
29 IRHN 2013; NatureServe 2013). This variety is associated with: *Artemisia frigida*, *Artemisia arbuscula*,
30 *Artemisia* sp., *Pseudoroegneria spicata*, *Happlopappus acaulis*, *Phlox hoodii*, *Chrysothamnus* sp., and
31 *Erigeron* sp. Simpson's hedgehog cactus is known from Oregon in the eastern portions of the Columbia
32 River Gorge in Hood, Multnomah, and Wasco Counties, as well as Owyhee County, Idaho (ORBIC
33 2010b; BLM 2011). It is considered by NatureServe (2012) to be common in western US in pinyon-
34 juniper and sagebrush communities, but not yet assigned a Global Status or analysis of conservation
35 status. There are presently no known occurrences of Simpson's hedgehog cactus within 8.7 miles of
36 the Proposed Action or alternative Actions, although suitable habitat exists and the species is likely to
37 occur.

1 SNAKE RIVER MILKVETCH (IDAHO BLM SENSITIVE)

2 Snake River milkvetch (*Astragalus purshii* var. *ophiogenes*) occurs in two states and is found (in
3 Owyhee County) on sand dunes and associated benches, degrading ashy bluffs, chalk hills, sandy
4 hillsides, steep to gently sloping hillsides, slopes below oolitic limestone cliffs; in basalt lithosol, volcanic
5 sands, ashy/sandy, sandy and sandy/gravel soils; reported from 2,300 to 3,400 feet elevation;
6 associated with plant communities dominated wholly by, or with various combinations of: *Artemisia*
7 *tridentata* ssp. *wyomingensis*, *Atriplex confertifolia*, *Chrysothamnus viscidiflorus*, *Juniperus occidentalis*,
8 *Purshia tridentata*, *Salvia doorii*, *Achnatherum hymenoides*, *Bromus tectorum*, *Hesperostipa comata*
9 and *Sisymbrium* sp. (CPNH 2013; IRHN 2013). Its Global Status is G5T3 (vulnerable) due to being
10 regionally restricted but not uncommon (NatureServe 2013). Snake River milkvetch is not known closer
11 than 7.3 miles from the Proposed Action Action, but is likely to occur since suitable habitat is present.

12 WHITE EATONELLA (IDAHO BLM SENSITIVE)

13 White eatonella (*Eatonella nivea*), also known as gray white eatonella and white false tickhead, occurs
14 in five states and is found (in B2H Project area counties) in barren ground, at bases of rock faces and
15 tops of ridges; in either fine soils including chalky sand to sandy and sandy silt loam soils, or coarse
16 soils including pebbles, small volcanic gravel, orange-tan fine gravels and gravel over rock; reported
17 from 3,200 to 4,200 feet elevation; known to occur without any other associated vascular plants, or in
18 communities dominated by either *Artemisia* sp., *Artemisia tridentata* ssp. *wyomingensis*, *Ericameria*
19 *nauseosa*, or *Achnatherum hymenoides*, as well as in the *Purshia tridentata* Shrubland, *Atriplex*
20 *confertifolia* Sparse Shrubland and *Grayia spinosa* Shrubland alliances and the *Artemisia tridentata*
21 ssp. *wyomingensis* / *Achnatherum hymenoides* Shrubland association (CPNH 2013; IRHN 2013;
22 NatureServe 2013). It has a Global Status of G4G5 (apparently secure), due to being noted as common
23 and widespread in parts of its range, although there is some threat from grazing (NatureServe 2013).
24 Presently, white eatonella is known to occur no closer than 5.7 miles from the Proposed Action in the
25 Hemingway Butte area of Owyhee County, although suitable habitat is present in the B2H Project area
26 and it may occur.

27 WINGED-SEED EVENING-PRIMROSE (IDAHO BLM SENSITIVE)

28 Winged-seed evening-primrose (*Camissonia pterosperma* syn. *Chylismiella pterosperma*), also known
29 as pygmy suncup or dwarf evening-primrose, occurs in six states and is found in Idaho and Oregon on
30 steep slopes, sides of limestone ridges and streamsides; reported from 5,097 to 5,678 feet elevation;
31 associated with plant communities dominated wholly by, or with various combinations of: *Juniperus*
32 *osteosperma*, *Artemisia arbuscula* (including ssp. *arbuscula*), *Artemisia tridentata* and *Artemisia nova*
33 (CPNH 2013; IRHN 2013; NatureServe 2013). It has a Global Status of G4 (apparently secure),
34 primarily based upon limited information from its full range (i.e., due to being uncommon from
35 California, infrequently but scattered throughout Nevada and no analysis elsewhere (NatureServe
36 2013). Winged-seed evening-primrose is reported from the Owyhee Mountains at 5,477 feet elevation,
37 thus apparently not found from within 5 miles of Proposed Action or alternatives, although it may occur
38 since suitable habitat exists.

1 *RAFINESQUE'S PONDWEED (OREGON BLM SENSITIVE, USFS SENSITIVE)*

2 Rafinesque's pondweed (*Potamogeton diversifolius*), also known as waterthread pondweed or diverse-
3 leaved pondweed, is a nationwide species which occurs as geographical outliers in Oregon and Idaho;
4 found primarily in man-made reservoirs, or rarely impounded wetland depressions (CPNH 2013; IRHN
5 2013; NatureServe 2013). It has a Global Status of G5 (secure), but hasn't been analyzed by
6 NatureServe for its conservation status. Waterthread pondweed is known from within 5 miles of the
7 Proposed Action in Idaho. Current population status is unknown.

8 *LEAST SNAPDRAGON (IDAHO BLM SENSITIVE)*

9 Least snapdragon (*Sairocarpus kingii* syn. *Antirrhinum kingii*), also known as king's snapdragon and
10 least toadsmouth, occurs in six states and Mexico, with Idaho as a geographic outlier. Rarely collected
11 from B2H Project area counties (CPNH 2013; IRHN 2013; NatureServe 2013). It has a Global Status of
12 G4 (apparently secure), but lacks analysis by NatureServe of its conservation status. Least snapdragon
13 is presently known near Reynolds Creek Road in Owyhee County, 3 miles from the Proposed Action.
14 Current population status is unknown.